

FAA ORDER 8110.49

“SOFTWARE APPROVAL GUIDELINES”

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OVERVIEW

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SOFTWARE APPROVAL GUIDELINES

(References)

INTRODUCTION

FAA Order 8110.49 “SOFTWARE APPPROVAL GUIDELINES” was released June 3, 2003.

The Order 8110.49 combines a series of notices (11 released between 1998-2002) into a single document. This order establishes guidelines for approving software in compliance with RTCA/DO-178B.

INTRODUCTION (cont.)

Orders are directives that the FAA uses to issue policy, instructions and work information within the FAA

Orders offer guidance on FAA procedures

They spell out how the FAA expects to do business, i.e. carry out its responsibilities

They are written chiefly as directives for FAA employees and for designees

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CHAPTER 2. SOFTWARE REVIEW PROCESS

Provide guidelines for performing software reviews

Standardize the review approach, e.g. FAA Job Aid

NOTE: Job Aid is in process of being updated. Goal is to have it completed by 12/31/03

CHAPTER 3. DETERMINING THE LEVEL OF FAA INVOLVEMENT (LOFI) IN SOFTWARE PROJECTS

Formulates when the FAA should be involved

Helps identify to what extent the FAA should be involved

Which areas the FAA should focus their involvement on

CHAPTER 4. CONFORMITY INSPECTIONS

Describes software conformity inspection processes (Software Part Conformity Inspection & Software Installation Conformity Inspection) for instances where the state of the software must be reviewed and documented before issuance of TC, STC, ATC, ASTC or TSO.

Used in conjunction with FAA approved Test Plan (not Software Verification Plan), FAA Aircraft level ground or flight test.

CHAPTER 5. APPROVAL OF FIELD LOADABLE SOFTWARE (FLS)

Provides guidelines/considerations when FLS is being used, namely what to do during:

- Development
- Loading
- Changing
- Installation

CHAPTER 6. APPROVAL OF FIELD LOADABLE SOFTWARE (FLS) BY FINDING IDENTICALLY THROUGH THE PARTS MANUFACTURER APPROVAL (PMA) PROCESS

- Limited to identity with or without a licensing agreement.
- Does not cover test and computation

CHAPTER 7. APPROVAL OF AIRBORNE SYSTEM AND EQUIPMENT CONTAINING USER-MODIFIABLE SOFTWARE (UMS)

Modification of UMS by the user should not have an effect on the aircraft safety margins, aircraft operational capabilities, flight crew workload, any non-modifiable software component or protection mechanisms of the system.

Coordinate with regulatory authorities responsible for approving changes to the aircraft configuration in the field i.e. Flight Standards personnel.

CHAPTER 8. PREVIOUSLY DEVELOPED SOFTWARE (PDS) APPLYING RTCA/DO-178B LEVEL D CRITERIA

Guidelines only apply for level D software.

Certification Authority Agreement up front is needed.

Data in place to prove:

- Plan was followed
- DO-178B objectives were met

CHAPTER 9. QUALIFICATION OF SOFTWARE TOOLS USING RTCA/DO-178B

Provide guidelines to ACO engineers and DERs for
Software Tool Qualification

Clarify differences between Development and Verification
Tools.

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CHAPTER 10. APPROVAL OF SOFTWARE CHANGES IN LEGACY SYSTEMS USING RTCA/DO-178B

Provide guidelines for transitioning from DO-178/178A to DO-178B

Software Level must be shown to be equivalent or better (otherwise use 12.1.4)

Changes to legacy systems and their process should be documented in Plan for Software Aspects of Certification (PSAC)

CHAPTER 11. OVERSIGHT OF SOFTWARE CHANGE IMPACT ANALYSES USED TO CLASSIFY SOFTWARE CHANGES AS MAJOR OR MINOR

Determine the impact of the change on the system

Assure that safety is not adversely affected

Determine the rework and reverification required

CHAPTER 12. APPROVING REUSED SOFTWARE LIFE CYCLE DATA

Reuse of software life cycle data on multiple certification project is feasible

If a data item hasn't changed and is applicable for the current project, it is a candidate for reuse

Present plan for reuse in PSAC and get early ACO agreement

NOTE: AC20-RSC (Reusable Software Component) coming soon.

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APPENDIX 1. LEVEL OF FAA INVOLVEMENT (LOFI)
WORKSHEET

APPENDIX 2. LOFI EXAMPLE 1

APPENDIX 3. LOFI EXAMPLE 2

APPENDIX 4. LOFI EXAMPLE 3

APPENDIX 5. FEEDBACK FORM

REFERENCES

Aircraft Certification Service Software Home Page

<http://av-info.faa.gov/software>

RTCA/DO-178B – SOFTWARE CONSIDERATIONS IN
AIRBORNE SYSTEMS AND EQUIPMENT
CERTIFICATION, December 1, 1992

RTCA/DO-248B – FINAL REPORT FOR
CLARIFICATION OF DO-178B “SOFTWARE
CONSIDERATIONS IN AIRBORNE SYSTEMS AND
EQUIPMENT CERTIFICATION”, October 12, 2001